

**NORTH CAROLINA OCCUPATIONAL SAFETY AND HEALTH
EDUCATION AND RESEARCH CENTER**

**SUMMARY ANNUAL REPORT
July 1, 2010 - June 30, 2011**

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Submitted By:

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North Carolina Occupational Safety and Health Education and Research Center

The purpose of the North Carolina Occupational Safety and Health Education and Research Center (NC OSHERC) is to train practitioners and researchers in the academic disciplines of Industrial Hygiene (IH), Occupational and Environmental Medicine (OEM), Occupational Health Nursing (OHN), Occupational Safety and Ergonomics (OS&E), and Occupational Epidemiology (OE). The program also provides continuing education for professionals in these areas who seek to maintain and update their skills. Program trainees will be well equipped to achieve the occupational safety and health objectives outlined in *Healthy People 2020* and continue to develop skills as addressed in the IOM report: Safe Work in the 21st Century. The NC OSHERC is administered by an Executive Committee consisting of the Center Director (Bonnie Rogers, DrPH, COHN-S, LNCC, FAAN) who also serves as the Program Director for OHN; Deputy Director (Judy Ostendorf, MPH, COHN-S, CCM, FAAOHN); Leena Nylander-French, PhD, IH Program Director; Dennis Darcey, MD, MSPH, FACOEM, OEM Program Director; David Kaber, PhD, OS&E Program Director; David Richardson, PhD, OE Program Director; and Kathleen Buckheit, MPH, COHN-S/CM/SM, FAAOHN, Director of Continuing Education and Outreach and Hazardous Substance Training Programs. All programs are located at the University of North Carolina, Chapel Hill, except OEM which is at Duke University and OS&E which is at North Carolina State University.

This report focuses on major accomplishments / highlights in program areas, including the impact of ERC programs within Southeast Region IV. The period covered by this report is 7/1/10-6/30/11.

Major Accomplishments

Outreach efforts have been outstanding by all faculty with enormous amounts of participation in the community and fostering translation of research to practice via numerous publications, collaborative sponsorships of courses, presentations, and consultations. Our NORA Interdisciplinary Seminar Series has been presented on campus and webcast so that all NIOSH funded students have been able to attend these required seminars along with outreach to the larger occupational safety and health community. All disciplines have been represented. The NORA Seminars continue to discuss research pertinent to NORA and have global participation.

The NC OSHERC Newsletter (News-E) is distributed to more than 20,000 members of the occupational safety and health community. It included information about each ERC program area, student accomplishments, and pertinent information about occupational safety and health.

Seven Pilot Project applications were received. Three were awarded: “Associations between Methicillin resistant *Staphylococcus aureus* (MRSA) carriage and occupational exposures to industrial animal production in eastern North Carolina”, (Leah Sinasi, UNC Doctoral student in OE); “MRSA prevalence among workers at conventional industrial hog operations compared to antibiotic-free hog farms in North Carolina”, (Christopher Heaney, UNC OE, W.K. Kellogg Health Scholar); and “Musculoskeletal disorders of veterinarians for large animals”, (Meghan Rogers, working with Dr. David Kaber).

Industrial Hygiene Program - Director: Leena Nylander-French, PhD

The Industrial Hygiene (IH) Program supported 4 Master’s students of whom 2 continued in the doctoral program during the academic year 2010-2011. Three IH trainees, received their Master’s degrees during this period. The IH trainees delivered 5 poster and/or oral presentations of their research findings in both national and international scientific meetings. One student was selected to deliver Student Spotlight Presentation and received a monetary award at the AIHA Carolinas Section Fall Professional Development Course and Conference, Greer, South Carolina. She presented her doctoral research, which was partially supported by the NC OSHERC Pilot Projects Program 2008-2009. During 2010, the IH trainees published 5 manuscripts. Additionally, 2 manuscripts have been accepted for publication, and 2 have been submitted for publication. *The Journal of Environmental Monitoring* featured our trainees’ research on the magazine cover (Gaines et al., JEM 12(3):591-599, 2010). During the summer 2010, the IH trainees began field work on our NIOSH supported research project (R01-OH009364) to investigate the effectiveness of protecting clothing to prevent diisocyanate exposure, a collaboration with the University of Washington IH Program. One IH trainee was able to use this experience as a practicum for the MSPH degree requirement. This project continues to provide trainees with research experience in conducting field studies to develop exposure assessment methods, to investigate exposure-dose-response relationships, and to calibrate models for the optimal control of exposure. Professors Michel Flynn and Rebecca Fry received a 4-year R01 grant from NIEHS to investigate regional brain manganese accumulation and functional consequences in welders. As an outreach activity, two of our previous IH trainees and current post-doctoral fellows at UNC-CH, participated in FEMMES (Females Excelling More in Math, Engineering, and Science) outreach program, which introduces young women (4th - 6th grade) to math, science, and engineering, by directing a hands-on activity that highlighted industrial hygiene education and professional practices.

Occupational and Environmental Medicine - Program Director: Dennis Darcey, MD, MSPH, FACOEM

The Duke Occupational and Environmental Medicine Residency Program (OEMR) continues to have a regional impact in Southeast Region IV by training occupational medicine physicians, providing extensive occupational health education opportunities for practicing occupational health and safety professionals, and conducting research relevant to preventing hazardous occupational and environmental exposures and disease.

The Duke program currently has two NIOSH funded residents. The first year resident comes to the program after spending the last two years with the CDC Epidemiology Intelligence Service. He completed a PhD in epidemiology during a combined MD / PhD program. He has participated in a number of occupational health studies and is already an accomplished epidemiology researcher. His PhD project led to a number of publications in the *Journal of Occupational and Environmental Medicine*. The second year resident is a graduate of the Duke Internal Medicine program, is Board Certified in Internal Medicine and practiced primary / preventive care medicine at the Durham, VA prior to starting residency. She recently completed the MPH degree at the UNC School of Public Health in the Public Health Leadership program. Her Master's thesis is being submitted for publication. A recent graduate is now working as an Occupational Health Medical Officer in the Office of Medical Services, U.S. State Department, Washington, DC.

Both current residents presented talks at the Annual Southeastern College of Occupational and Environmental Medicine in Charleston, SC, September 2011. The results of our recent graduate's NIOSH NORA Pilot Project, was presented at the 2011 American College of Occupational and Environmental Medicine Conference in Washington, DC.

In the last year Duke's OEM faculty and residents provided Continuing Medical Education training for 2,704 occupational health professionals in medicine, nursing, safety, and industrial hygiene employed in industry, government and academia in Region IV. The Annual Southeastern Regional Meeting of the Carolinas Occupational Medicine Conference sponsored by the NC OSHERC was attended by over 40 practicing occupational medicine physicians throughout North and South Carolina and Virginia.

Occupational Health Nursing Program - Program Director: Bonnie Rogers, DrPH, COHN-S, LNCC, FAAN

The Occupational Health Nursing (OHN) Program has been part of the NC OSHERC for more than 30 years. The goal of the Program is to provide education, training, and research experiences as appropriate to occupational health nursing professionals, so as to transfer learned knowledge to protect and promote the health of the workforce. During this reporting period six trainees were admitted and one trainee graduated.

Program graduates continue to publish articles in professional publications. Current student and faculty published three continuing education articles in the *AAOHN Journal* during this reporting period. Dr. Bonnie Rogers recently received the prestigious Alice Hamilton Award 2011, honorable mention in the Human Studies Category, for her evaluation of antineoplastic drug exposure of health care workers at three university-based US cancer centers. Dr. Rogers was appointed in 2011 to the Board of Scientific Counselors (BSC) by the Health and Human Services Secretary Kathleen Sebelius and appointed Chair of the Board by Dr. John Howard. The OHN Program faculty continues to actively participate in the NC OSHERC continuing education/outreach efforts, which focus on Southeast Region IV. Offered annually are the "OHN Certification Review" and the "Occupational Health Nursing: Introduction to Principles and Practice" courses each year.

Occupational Safety and Ergonomics Program - Program Director: David B. Kaber, PhD

The major accomplishments for the Occupational Safety & Ergonomics (OSE) Program this year included trainee graduations, journal and conference publications of student research, and new student and faculty recruiting. Two masters' students graduated in spring 2011 and completed theses on: "The Effect of Handle Design on the Kinetics and Kinematics of a Pouring Task" and "Identifying and Modeling Perceptions of Risk Factors in Hand Hygiene during Healthcare Operations". On the basis of Program research, trainees publish with faculty, articles in the journals of *Applied Ergonomics*, the *International Journal of Industrial Ergonomics*, and *Professional Safety*. Trainees also published and presented papers through scholarly meetings including the *Annual Meeting of the Human Factors and Ergonomics Society (HFES)*, the *Applied Ergonomics Conference*, and the *Human-Computer Interaction International Conference*. Two new masters students were recruited for study of brain-computer interfaces (BCI) for disabled persons and the use of virtual reality for assessing human multitasking in cognitive and physical performance. In addition, a new full-time research and teaching faculty was hired to support instruction in human factors and human-computer interaction on the graduate-level and ergonomics for undergraduates. Faculty activities this year included publication of 10 journal articles. Dr. Kaber also served as an associate editor for two scholarly journals, including *IEEE Systems, Man & Cybernetics* and the *Journal of Cognitive Engineering & Decision Making*.

The major impacts the OSE Program has had on the region have primarily occurred through the NC State University Engineering On-line (distance education) Program and participation of the Ergonomics Lab in professional training workshops through the Ergonomics Center of North Carolina (ECNC). This past summer, the OSE program offered

“Human Factors & Systems Design” (ISE 540) to 11 national and international professionals. In the preceding spring term, the OSE program offered “Occupational Safety Engineering” (ISE 541) to another 11 national and international professionals. The Ergonomics Lab collaborated with the ECNC in providing groups of 6 to 10 regional professionals with training on ergonomics measurement instrumentation, research methods and contemporary research directions. Beyond these impacts, three of the OSE Program trainees worked part-time at the ECNC supporting ergonomics training courses, ergonomics field evaluations at North Carolina-based companies, and applied ergonomics research.

Occupational Epidemiology - Program Director: David Richardson, PhD

Occupational Epidemiology is an allied research program that has been part of the UNC OSHERC since 2001. The mission of the occupational epidemiology program is to train highly-qualified scientists who will develop and apply the theory, methods, and substance of epidemiology to protect workers’ safety and health. With the program now in its tenth year, emphasis is being placed on engaging trainees in high-quality research on occupational health and safety, supporting trainees in contributing scholarly publications, and ensuring that they successfully complete the program. Two students were reappointed as trainees this year and are working on their dissertation projects. One doctoral student is working on methods for occupational cohort analysis with a focus on mortality among US Department of Energy workers and the second, who was 1 of the 3 pilot project awardees, is working on occupational and environmental factors related to MRSA carriage among hospital patients in eastern NC. Dr. David Richardson was appointed by President Obama to the Advisory Board on Radiation and Worker Health.

Continuing Education Program - Program Director: Kathleen Buckheit, MPH COHN-S/CM/SM, FAAOHN

Since 1976, the Continuing Education (CE) Program has provided quality opportunities for occupational safety and health professionals. Needs assessments, outreach, recruitment, and course evaluations indicate that a substantial need exists. CE Program objectives measure success and are being met. Course evaluations confirm that CE programs and services are being effectively and efficiently delivered. Both academic and non-academic faculty, including experienced practitioners and consultants representing all occupational health and safety disciplines, offer a unique blend of theoretical and practical experience. All engage in outreach with professional associations, public agencies, and universities and participate as course directors, planners, presenters, evaluators, and technical advisors.

New courses are offered every year and many are in partnership with professional associations including South Eastern Atlantic College of Occupational and Environmental Medicine (SEACOEM), American, NC, and NC Tarheel Associations of Occupational Health Nurses (AAOHN, NCAOHN, NCTAOHN), Carolinas Section of the American Association of Industrial Hygienists (AIHA), and American Society for Safety Professionals (ASSE). NC OSHERC continues to collaborate with the Sunshine ERC at the UNC Annual Winter Institute in presenting the CAOHC Hearing Conservation Certification and Re-certification Courses. The second annual collaboration with the Sunshine and Deep South ERCs was held at the FL Workers Compensation Institute in Orlando, FL, presenting the R2P programs. EPA’s Renovation, Repair, and Painting Certification Course is offered in both English and Spanish.

Trainee recruitment, including diversity efforts, met the training needs of the region. The geographic statistics indicated that 82% of the trainees were from the southeast region. For 2011-2012, the diversity breakdown of attendees reporting their ethnic background was: White - 82%; Black - 8%; Hispanic - 5%; Asian - 3%; American Indian - 2%. The CE Program trained 3,718 students in 106 courses.

Hazardous Substance Training - Program Director: Kathleen Buckheit, MPH, COHN-S/CM/SM, FAAOHN

The NC OSHERC Hazardous Substance Training (HST) Program has been growing and expanding throughout the Southeast region. Kentucky and Tennessee have been the focus of training this past year.

The geographic statistics indicated that 85% of the trainees were from the southeast region. For 2010-2011, the diversity breakdown of attendees reporting their ethnic background was: White - 84%; Black - 10%; Hispanic - 3%, Asian - 2%, American Indian - 1%. The HST Program trained 820 students in 32 courses. Over \$10,000 from the NIOSH HST grant funding was used to support training of state and local government workers and several free courses were provided.

New and exciting opportunities are being developed in the NC OSHERC. Partnerships are increasing with Local Emergency Planning Committees, Hazardous Materials and Firefighters Associations, and Rapid Responders Team (RRT). NC OSHERC is working on a Needs Assessment Program with the NC Department of Environment and Natural Resources (DENR) and is working to provide the Certified Hazardous Materials Manager (CHMM) Certification Review Course for them. NC state funds were significantly restricted and allowed state employees to participate in only free training programs. Fourteen AT&T employees met the requirements and graduated from the Telecommunications HAZMAT Specialist Certificate Program.